

Name _____ Period _____ Date _____

1.3

Understand the relationship between zeros and factors of polynomials

End Behaviors

For the given polynomials determine which of the binomials listed are factors. State what method was used (factoring or remainder theorem). Show work!

1. $f(x) = 2x^2 - 8x + 6$

a. $x+1$

b. $x-1$

c. $x-3$

2. $f(x) = x^2 + 9x$

a. $x-3$

b. $x-0$

c. $x+9$

3. $f(x) = x^2 - 3x + 2$

a. $x+2$

b. $x-2$

c. $x-1$

4. $f(x) = x^3 - x^2 - 5x - 3$

a. $x+1$

b. $x-1$

c. $x-3$

5. $f(x) = x^3 - 3x + 2$

a. $x-1$

b. $x+2$

c. $x+1$

6. $f(x) = x^3 - 3x$

a. $x+0$

b. $x-2$

c. $x-1$

$$7. f(x) = x^3 + x^2 - 16x - 16$$

$$a. x+1$$

$$b. x-4$$

$$c. x+4$$

$$8. f(x) = x^3 + 27$$

$$a. x-3$$

$$b. x+3$$

$$c. x-9$$

$$9. f(x) = x^2 + 3x - 10$$

$$a. x+2$$

$$b. x-2$$

$$c. x+5$$

$$10. f(x) = x^3 - 2x^2 - 5x + 6$$

$$a. x+2$$

$$b. x-1$$

$$c. x+9$$

$$11. f(x) = x^3 + 5x^2 - 12x - 36$$

$$a. x+2$$

$$b. x-3$$

$$c. x+6$$

Without graphing, determine the number of zeros for each of the following polynomials.

$$12. f(x) = 2x^2 - 8x + 6$$

$$14. f(x) = x^2 - 3x + 2$$

$$16. f(x) = x^3 - 3x + 2$$

$$18. f(x) = x^6 + x^2 - 16x - 16$$

$$20. f(x) = -x^4 + 3x - 10$$

$$22. f(x) = x^3 + 5x^2 - 12x - 36$$

$$13. f(x) = -x^2 + 9x$$

$$15. f(x) = -x^3 - x^2 - 5x - 3$$

$$17. f(x) = x^5 - 3x$$

$$19. f(x) = -x^7 + 27$$

$$21. f(x) = -x^3 - 2x^2 - 5x + 6$$

$$23. f(x) = x^4 - 2x^2 - 5x + 6$$

Without graphing, determine the end behavior of each. State the degree of the polynomial and determine whether it is even or odd, then write the end behavior as a limit.

$$\lim_{x \rightarrow -\infty} f(x) =$$

$$\lim_{x \rightarrow \infty} f(x) =$$

24. $f(x) = 2x^2 - 8x + 6$

25. $f(x) = -x^2 + 9x$

26. $f(x) = x^2 - 3x + 2$

27. $f(x) = -x^3 - x^2 - 5x - 3$

28. $f(x) = x^3 - 3x + 2$

29. $f(x) = x^5 - 3x$

30. $f(x) = x^6 + x^2 - 16x - 16$

31. $f(x) = -x^7 + 27$

32. $f(x) = -x^4 + 3x - 10$

33. $f(x) = -x^3 - 2x^2 - 5x + 6$

34. $f(x) = x^3 + 5x^2 - 12x - 36$

$$35. f(x) = x^4 - 2x^2 - 5x + 6$$

$$36. f(x) = -x^6 + 5x^2 + 6x - 13$$

$$37. f(x) = -x^5 + 10x - 14$$

$$38. f(x) = -8x^{20} - 3x^5 + 2x^3 - 4x + 1$$

$$39. f(x) = x^{12} + 4x^2$$

$$40. f(x) = -x^{11} - 2x^9 + 6x^4 + 18$$

$$41. f(x) = -x^6 + 13$$

$$42. f(x) = 6x^{13} + 8x^2 - 10x + 24$$